

REMARKS

The claims in the application remain 1-20.

Favorable reconsideration of the application as amended is respectfully requested.

The present amendment is being made in accordance with a telephone interview between the Examiner in charge of the above-identified application at the Patent and Trademark Office and the undersigned attorney on Tuesday, August 1, 2006. The courtesy extended by the Examiner in arranging for and conducting the telephone interview, is greatly appreciated.

Independent Claim 11 has been amended as proposed during the telephone interview, additionally as discussed and incorporating recitation from proposed dependent Claim 21; more particularly, independent Claim 11 has been amended to recite, among other features,

(i) the transport apparatus 14 is arranged for transporting a mixture of solid pyrolysis residue and circulating fluidized bed material 35 into a bottom or location near the bottom of the combustion bed 3 and is disposed towards the bottom of the fluidized bed 3 and underneath the lower end of the pyrolysis reactor 1, and

(ii) the overflow is situated at or near a top of both the fluidized bed 3 and pyrolysis reactor 1, immediately underneath the heat transfer member 2 in the reaction zone 2 of the fluidized bed reactor 3 and downwardly sloping to the pyrolysis reactor 1 (reference is being made to preferred embodiments of the present invention illustrated in the drawings of the present application). Support for the present amendment to independent Claim 11 is found throughout the present application, e.g., in Fig. 3 and accompanying description in the specification.

Claims 1-20 have been rejected under 35 U.S.C. §103 as being obvious over WO

99/31197 to Muhlen et al in view of U.S. Pat. No. 4,568,362 to Deglise et al on pages 2-7 of the Final Office Action. However, it is respectfully submitted in light of the amendments to independent Claim 11 *supra*, the presently claimed invention is patentable over this combination of references for the following reasons (reference will be made to preferred embodiments of the present invention illustrated in the drawings of the present application).

As pointed out in the preceding amendment, the present invention improves pyrolysis and gasification of organic substances with high calorific value in simplified, more efficient manner and increasing energy conservation. These and other advantages are attained by the inventive apparatus recited in Claim 11 which is directed to pyrolyzing and gasifying organic substances and comprises a pyrolysis reactor 1, a fluidized bed firing 3 for pyrolysis residue, and a reaction zone 2 for pyrolysis gases 13, with fluidized bed material 35 circulating between the combustion fluidized bed 3 and pyrolysis reactor 1. More specifically, the pyrolysis reactor 1 is a shaft or rotary reactor and comprises a sluice for introducing application material 10 thereinto, with an inlet for the fluidized bed material 35 into the pyrolysis reactor 1 from the combustion fluidized bed 3 being disposed next to the combustion fluidized bed 3.

Additionally, the pyrolysis reactor 1 has transport apparatus 14 arranged for transporting a mixture of solid pyrolysis residue and circulating fluidized bed material 35 into a bottom or location near the bottom of the combustion fluidized bed 3 and disposed towards the bottom of the fluidized bed 3 and also underneath the lower end of the pyrolysis reactor 1. Furthermore, the combustion fluidized bed 3 has an overflow situated at or near a top of the fluidized bed 3 and pyrolysis reactor 1, arranged to transfer the circulating fluidized bed material 35 into the shaft reactor 1 and be constantly filled with the circulating fluidized bed material 35, positioned

immediately underneath the heat transfer member 2 (in the reaction zone 2 connected to the pyrolysis reactor 1 for receiving the pyrolysis gases 13 from the pyrolysis reactor 1 and to which waste gases 37 from the combustion fluidized bed 3 are supplied for heat exchange with the pyrolysis gases 13) and downwardly sloping to the pyrolysis reactor 1.

Referring to Canadian application 2,314,094 (the English equivalent of Muhlen et al), Muhlen et al disclose a system in which heat carrier medium 414 is fed into a top of shaft kiln 403 from a conveyor 409 via sluice 410 so the heat carrier medium can travel downwardly through the kiln 403 (Fig. 4, page 8, lines 22-27 and page 9, lines 5-8). At the bottom of the kiln 403, the resulting pyrolysis mixture 414, 426 is fed onto a grate 405 of firing stage 407 (page 8, line 28- page 9, line 5). In contrast, the transport apparatus of the claimed invention is arranged to transport the mixture of solid pyrolysis residue and circulating fluidized bed material into the combustion fluidized bed 3 at or near the bottom of the fluidized bed 3.

Moreover, Muhlen et al do not show a fluidized bed reactor and explicitly teach away from utilizing a fluidized bed reactor for the following reasons. At page 9, lines 1-2 of Muhlen et al, it is stated heat carrier medium consists of coarse-grained material such as sand, gravel, or split (crushed stone). A stationary fluidized bed cannot be used with such large-grain particles. Additionally, it is explicitly stated at page 2, lines 9-10 of Muhlen et al that it is very costly to operate (prior art) fluidized beds and virtually impossible to control reaction of the pyrolysis gases in the reaction zone. Accordingly, the present invention constitutes an explicit improvement over the system shown in Muhlen et al.

Deglise et al have been cited as showing a lateral overflowing pipe 8 (column 2, lines 28-40). However, the lateral overflowing pipe 8 is positioned between fluidizing grate 4 and four

levels of hot refractory particle rainfall packed bed contactor 9 (column 2, lines 40-45 and Fig. 1) and branches into an intermediate location of combustion reactor 24. In other words, contrary to the presently claimed invention, Deglise et al fail to teach or suggest positioning an overflow situated at or near the top of the fluidized bed 3 and pyrolysis reactor 1 for transferring circulating fluidized bed material 35 into the pyrolysis reactor 1. Therefore, Deglise et al add nothing to Muhlen et al which would render obvious the invention recited in any pending claim herein.

The remaining art of record has not been applied against the claims and will not be commented upon further.

Accordingly, in view of the forgoing amendment, accompanying remarks and telephone interview in the above-identified application, it is respectfully submitted all claims pending herein are in condition for allowance. Please contact the undersigned attorney should there be any questions. Transmittal papers for filing a Request for Continued Examination (RCE) are enclosed, together with the requisite filing fee.

Early favorable action is earnestly solicited.

Respectfully submitted,



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